

LOUISVILLE MEDICAL NEWS.

"NEC TENUI PENNA."

Vol. VI.

LOUISVILLE, SEPTEMBER 28, 1878.

No. 13.

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EDITORS.

Original.

PLASTIC APPARATUS IN SURGERY,

With Especial Reference to its Use in the Treatment
of Fractures of the Femur.

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The criticism of medical and surgical procedures is always a delicate and difficult task. To have a bias or prejudice is almost inherent in human nature, and perhaps stronger in medical human nature than in most other cases. We are bound by axiom to speak well of the bridge that carries us over, and if ours breaks once in a while we are apt to think that the load was too heavy for *any* bridge, and not to listen complacently to the suggestion that bridge-building has improved since we learned how to build. This tendency in medicine is particularly strong, because it is so difficult to compare the loads which different bridges are called upon to sustain. When we take into account, for instance, differences of constitution, temperament, nature of accident or disease, previous condition of health, etc., we can hardly conceive it possible to make a fair comparison between two different methods of treating typhoid fever or fractured tibia. The standpoint, too, from which a man speaks, must modify deeply his *words*, and, to preserve harmony, his *ideas* also. A man whose sphere of influence is limited has little to fear from giving rash counsel. His insignificance protects him from the reproach of having been a reckless adviser, for no one takes his advice without other good reasons, and he may therefore zealously advocate methods which an acknowledged authority would hesitate to indorse for fear of leading some one into

mischief. For this reason *authorities* are always conservative; they would rather bear the reproach of slowness than expose themselves to the imputation of giving rash advice.

It is unquestionably fortunate that this is so, for we have thus preserved by natural laws the two essential elements of all healthy progress, namely, the adventurous experimental progressive element, without which science would be at a standstill, and the conservative custom-honoring element which checks, represses, and modifies.

The general tendency of authors and teachers being, then, toward conservatism, we find that they differ among each other in this respect, those being generally the most conservative whose writings are the most elaborate, the most carefully worded, and the most systematic. When, therefore, we find such an one espousing heartily an innovation we must regard his testimony as having greater force, since it is forced from him, as it were, by the irresistible logic of facts, the natural bent of his mind working constantly against the newcomer. By the same rule we must regard the opposition of such an one to novelties as natural, almost instinctive, and worthy of the respectful consideration always due from the enterprising present to the honored past.

Since an appeal will be made to *statistics* to support the arguments adduced in this paper, a few words as to their legitimate field and to the dependence to be placed upon them will not be inappropriate here. It has been said on the one hand that "figures never lie," and on the other "that one can prove any thing by statistics," and there is some truth in both of these proverbs. Of course we must assume that the figures are obtained as correctly as the collator is able and are not dishonestly tampered with—a charge which fortunately is rarely encountered in medical circles. When, however, we reflect that the collators of statistical tables are almost invariably interested parties who hope to prove something by the

*Read before Surgical Section of New York Academy of Medicine, May 14, 1878.

figures, and connect this with the ease with which the bad cases may, with perfect honesty, be rejected because of some feature in the case which renders it unfit for comparison with the rest, how can we deny all truth to the adage that one can prove any thing by statistics. Far be it from me, however, to decry them, for without them we must depend upon general impressions and vague generalities. No; they are useful, they are invaluable, but they do not form our *sole* reliance, and to their testimony we must add the soundness of the theory involved, the adaptation of means to ends, and the opinions of experienced men; only thus by combining theoretical reasoning with facts and opinions derived from the preceding two can any man form an accurate opinion upon a method of treatment.

The subject of the present article, the use of Plastic Apparatus in Surgery, especially in Fractures of the Femur, is one to which the writer gave a great deal of attention in 1870 and 1871, and he has since that time taken an especial interest in it, since he was the first to suggest its use in several surgical emergencies, notably for fracture of the ribs, which was the starting point for the development of the plaster "jacket," used with such remarkable success by Dr. Sayre and others. In 1872 he called the attention of the profession, through the columns of the American Journal of Medical Sciences, to the advantages of the "plastic" apparatus, by which term was meant all apparatus made of material which at the time of application was soft enough to take the shape of the limb and which subsequently hardened sufficiently to support it. The statement was then made that the advantages of this kind of surgical appliance were so great as almost to mark an era in surgery and to involve a new principle, and it might have been added that the plastic apparatus was not destined to become popular among surgeons who delighted in tightening straps and shifting pads, in cutting away a piece of the splint here, or loosening a bandage there, or perhaps taking off the whole apparatus every day or two and readjusting the fragments, a maneuver to which the patient in many cases attributes the salvation of his limb, if not his life. In short, plastic apparatus will never be popular with men who like to fuss and potter and impress the bystanders with the magnitude of their own importance in the matter, glorifying themselves at the expense of nature. If there are any such among the readers of this journal,

they are earnestly recommended to read Dr. Marcy's article in the Boston Medical and Surgical Journal, June, 1877, regarding the surgical sinfulness of disturbing the newly forming bone at the seat of fracture.

Another class of men who do not take kindly to plastic apparatus are those who have invented splints to fulfill indications. The indications which can not be fulfilled by plastic apparatus can be counted on the fingers of one hand, for if the plastic material hardens rapidly, as does gypsum, the parts may be held in position by the hand until the splint is sufficiently firm to retain them, and its accurate fit distributes the pressure so as to avoid excoriation. Hence surgeons whose reputations rest upon splints to fulfill indications find plastic apparatus a dangerous rival. The ground upon which they stand is swept from under their feet, and their ingenious systems of levers, straps, pads, and slings, with the super-jacent reputations, are relegated to the museum of history.

The third class of opponents of plastic apparatus, and the class which I hope to reach in my arguments, is composed of surgeons who, with minds open to conviction, have given the system the benefit of careful trial, who have used it judiciously, applied it skillfully, noted accurately the results, and compared these with results obtained under other methods of treatment in similar cases. Not all these observers have statistics to show, but they have opinions which, as has just been shown, are as essential in judging of a method as any statistics can be.

The method formerly in vogue of treating simple fractures by constitutional remedies for the first few days and considering the local appliances as entirely secondary, has passed into history, and the surgeon's first thought now is how to restore the fragments to their normal relations with the least violence and retain those relations without injury to the surrounding parts.

The innumerable splints that have been devised from time to time have had two objects in view; first, by their stiffness to afford a firm artificial bond of union between the severed fragments; and, second, by their shape to accommodate themselves to the contour of the limb so as to not press too firmly on bony prominences while failing to support depressions. The irregularity of the limbs is so great that mechanical skill in shaping the splints fails to secure the latter end, and the help of pads and cushions was invoked to prevent excoria-

tions and secure the more thorough support of the limb, and until plastic apparatus was introduced discussions upon the mechanical part of the treatment of fractures took the shape mainly of disquisitions upon the lever-like action of one part of the apparatus or the fulcrum-like function of another, and afforded excellent opportunities for the exhibition of knowledge of the principles of mechanical action. This method of treatment also afforded grand opportunities for display to the class of men I have already alluded to, who glory in tying and untying strings and in shifting pads and cushions, for there can be no manner of doubt that the strings must be re-tied and the pads shifted if the splints are to fulfill their function and excoriations are to be avoided.

The special advantages of plastic splints were tabulated and illustrated in my paper in 1872, and I see no reason to recall a single item. They were the following: *Little tendency to displacement of splint*; hence obviating frequent readjustment. *Freedom of patient to go about*; this of course applying to simple uncomplicated fractures. *Less irritation, less extravasation of blood, less pain, and less liability of excoriation*. Here it may be noted that almost all excoriations produced by plastic apparatuses are by the nature of the case at the *edge* of the splint, and by watching the limb closely and cutting away any constricting band or pushing a little cotton-wool under the edge, this source of discomfort and danger may be avoided. The excoriations, when they occur, are usually in plain sight and do not form one of the "hidden dangers." The *uniform compression* by which we secure muscular rest, prevent swelling, and lessen swelling which already exists is one of the greatest advantages of the method, but it is in careless hands one of its greatest dangers. Almost any intelligent person can learn in a short time to apply a gypsum splint neatly and efficiently, but to do it judiciously, giving sufficient support by the accuracy of the fit, while avoiding the other extreme of applying it too tightly, calls for the exercise of surgical judgment of a high order. The mistake generally made by tyros is in putting the splint on too tightly. In their eagerness to make a handsome apparatus and secure the beneficial effects of immobility they forget that the superficial venous system is very easily compressed and that a little swelling must be expected in spite of their splint. The congestion consequent on interference with

the superficial veins aggravates itself according to well-known laws, and the splint must be removed or loosened to avoid gangrene. If there is any reason to fear that the deep venous system is impaired, as when from the nature of the accident the fragments have made extensive excursions into the surrounding tissues, or when the superficial veins seem overfull, it is always the part of prudence to adopt some variety of the plastic splint that allows of free inspection, such as that introduced into the New York Hospital by Dr. Little, or to use the ordinary extension by weight, or even, in extreme cases, to treat without apparatus for a few days until it is certain that the deep venous trunks are uninjured. I believe that the neglect of this simple rule has given rise to the majority of cases of injurious constriction of limbs which have occurred under this method of treatment, for cases have come to light where the rules of surgical procedure would have pronounced the application of a simple bandage to be contra indicated, in which, however, a gypsum apparatus was applied apparently because there was a fracture, and the treatment of fractures by gypsum splints was highly recommended in hospitals.

As regards the details of the application of plastic splints, little or nothing remains to be said. The subject has been so often brought before the reading medical public that the various steps are familiar, and they are indeed minutely detailed in the latest edition of Dr. Hamilton's work on Fractures and Dislocations and in other leading textbooks. Pasteboard, felt, gutta percha, leather, cloth soaked in paste of starch or of flour and white of eggs, etc. serve an admirable purpose; and an extremely light and serviceable splint can be made after the suggestion of Dr. Cowling, of Louisville, by using strips of manila paper soaked in the stiffening solution. The choice of material will depend partly upon the facilities at hand, but mainly upon the nature of the case, and in a very large number of cases the only thoroughly serviceable material is one which hardens in a few minutes—viz. gypsum. The especial way in which the surgeon will use this will depend much upon the way in which he learned to use it. Those who began by soaking cloths in a solution of gypsum, and applying them directly to the skin, will probably continue to use this method, and will achieve perhaps as brilliant results as Dr. Little, who is the especial champion of this excellent method; a method which has

the advantage of being perfectly safe to *teach* as well as to *use*, for it is next to impossible that this form of splint should do harm in the hands of inexperienced men. Those, however, who have learned to use the plaster *bandage* think that in this method they succeed in making neater and better fitting splints, with less soiling of clothes and other surroundings. If the splint be divided lengthwise soon after application, and a strip removed as recommended in my former paper, there is no essential difference as regards safety. The method by soaked cloth is not a reliable one in fracture of the femur, as in this way it is difficult to carry the inner edge of the splint well up against the pelvic bones, and maintain extension. The better way for a novice to do in such a case is to put on the splint by using the plaster bandage, and just before it is thoroughly hard remove a strip in front from Poupart's ligament down to the middle of the leg, which will lessen the danger of constriction and afford an opportunity for inspection. This will not materially weaken the splint, and by filling the space with cotton wool and applying a roller bandage cedema through the opening may be prevented.

A modification known generally as the "Bavarian hinged splint" (described by Englisch in the Wiener Med. Presse as the klappen-formige gypsverband) is a very useful and attractive form. It is made by placing three or four pieces of flannel, of the length of the limb and broad enough to nearly encircle it, on each other, and stitching them together by two rows of stitches down the center about one quarter of an inch apart; then by separating the layers and rubbing in plaster the splint is ready to apply. Soaking it in water, and enveloping the limb with it, a bandage is applied over it, and when dry the two lateral halves will separate like the leaves of a book, since the strip included between the rows of stitches has received no plaster, and consequently is pliable.

It is, however, in the treatment of fractures of the femur that the use of plastic apparatus has been especially called in question. It is not many years since any fracture of the lower extremity, however free from complications or marked constitutional disturbance, was relegated to bed for several weeks; but there has been a gradual recession from that position; partly from the pressure brought to bear by the patients, who insist upon being allowed liberty enough to

transact some business, and partly from the surgeon's observation of the immunity that often followed transgression of orders regarding strict confinement. We find, then, that our most advanced surgeons do not as a rule confine strictly to bed cases of simple fracture of the tibia and fibula, at least not after the initial acute symptoms have passed away; but that, having provided the injured limbs with suitable splints to afford firm supports, they permit limited movements upon crutches, and bring to the repair of the fracture the help given by increased powers of digestion and better blood oxygenation.

The application of this principle to fractures of the femur introduced a new question, viz. is it possible to apply to these cases an apparatus which shall maintain, when the patient is in the erect position, upon crutches, or when seated upon a chair, that extension which experience has shown us is necessary to insure a union without excessive shortening? This was the question which Mr. Erichsen, of London, undertook to solve twenty-four years ago in using the starch apparatus; and his hearty indorsement of the method sixteen years later, and still more recent advocacy of it in the latest edition of his text-book, justifies us in considering that he has answered the question affirmatively. Still, when we find so justly celebrated and so universally respected an authority as Dr. F. H. Hamilton stating that "the use of plastic dressings for fracture of the thigh was a step backward instead of forward, for by it we can not get the slightest extension or counter-extension, and the limb shortens as much as it is possible for it to do," we are surely called upon to go carefully over the ground, and see whether these statements have that broad foundation of statistical facts and theoretical argument which usually characterize the assertions of this author. The ineffectiveness of this method has also been recently emphatically asserted by a surgeon of whom our western states are justly proud—Professor Hodgen, of St. Louis. But he is doubly disqualified to decide, first, because he has a splint of his own in which he has an overpowering paternal interest; second, he admits in a courteous letter to the writer that he has never used the gypsum splints in adults, while the cases in which he has used them in children have all done well, with a single exception. Our first-named authority and objector has no splint distinctively his own, and has given the gypsum splint a trial on several patients in Bellevue Hospital.

It is of importance that the opinion of the profession should be obtained upon this point, because the method is one which has been used very extensively in New York, and which is liable to be used by practitioners who have received their education in this city during the past ten years, and yet its condemnation in a recent clinical lecture has been complete, no concession or compromise being granted. It was not admitted that if applied by skillful and experienced hands it might perform its functions even in an imperfect degree. The patient had only been subjected to the annoyance and danger of an apparatus which often inflicted irreparable injury, which might indeed cause his death, but which could not conduce in any way to his recovery. This position, it will at once be seen, if supported by the profession, affords a strong basis for a suit for malpractice against any surgeon who may use this method of surgical procedure.

Authority implies responsibility, and a representative man should teach only what he believes to be correct and safe; but his desire to dissuade his students from using a particular method of treatment does not justify statements which are unsupported by facts; which, if true, prove some of the most eminent surgeons of the world ignorant alike of the principles of mechanics and of the laws of nature's processes, and which expose to a malicious prosecution for malpractice many of his professional brethren who have used this method of treatment in many cases with as satisfactory results as could have been expected under any other form of treatment.

The question at issue is not, therefore, whether the gypsum splint is the *best* method of treating fractures of the femur, but whether it is under any circumstances or in any hands a justifiable one to employ. If with it the limb shortens as much as is possible for it to shorten, it is not justifiable, and the surgeon who uses it should be condemned for exposing his patient to unnecessary risks and danger.

The tests by which we judge of the efficacy of any surgical procedure are in the main three in number: First and least important, the theoretical; that is, whether, reasoning from what we know of the nature of the disease or accident, and of the presumable effect of the procedure, the latter is calculated to ward off the evil tendencies of the former during the progress of the cure; second, whether it is indorsed by representative men, who have given it a fair trial; and third, whether the results, as

shown by careful and accurate statistics, compare favorably with results obtained by other procedures in the same class of cases.

In the first place, then, is it reasonable to suppose that a gypsum apparatus can prevent shortening? I affirm that it not only can, but that the *modus operandi* is more rational and more surgically correct than by the extension method. The latter, excellent and reliable though it is practically, is theoretically rude and unscientific. It accomplishes by the constant use of force what should be done by persuasion. The plan of treatment with the gypsum apparatus consists in putting the bones in position, and constructing a splint which shall oppose any tendency to relapse, but which is entirely passive in the absence of any such tendency. The splint is thus the gate which is shut to prevent escape, and not, like the extension, the rope by which the animal is tied, and at which he constantly tugs in his efforts to get away. Theoretically, then, constant extension is constant irritation, unless it be possible to so nicely adjust the weight as to exactly overcome the muscular spasm, neither more nor less. *Less* we dare not use, for fear of a bad result. *More* will insure against that danger, but every superfluous ounce is so much irritation to exhausted muscular fiber and stretched nervous tissue. Is it practically possible to attain and maintain this nicety of degree of extension? Is not the muscular spasm which calls for extension varying every hour, as fresh irritation is supplied by unavoidable movements in bed and other extraneous causes, and not, as some think, an ever-decreasing factor which justifies the subtraction of a few ounces every day or two from the extending weight?

But it is said that the thigh can not be kept extended, because the perinæum can not be used as a point for extension; that if the gypsum be carried all the way up to the perinæal fold, ulceration must ensue; and the theory is that the perinæum, like all other tissues, can not endure *constant* pressure. To hold this ground, it must first be shown that there *is* constant pressure in such a case. Pressure comes from muscular spasm, producing tendency to shorten; and if the close-fitting apparatus, by its double action as a splint to hold the fragments still, thereby preventing mechanical irritation, and as a snug bandage repressing muscular action, eliminates the causes, the effect does not follow. We are not justified in saying that because perineal straps excoriate

when the weight and pulley are used, therefore the perineal edge of the gypsum splint must do so; for in the one case we have *constant* pressure, in the other only *intermittent* pressure. To illustrate: a femur fractured by indirect violence is extended to nearly or quite its normal length, and a gypsum splint applied which fits snugly into the perinæum with an elastic pad of blanket half an inch thick as a cushion to rest against. So long as the muscles are at rest there is no more pressure on the perinæum than is expressed by the snugness of the fit, and this ought not to be more than the elasticity of the blanket cushion can modify to the point of permitting perfect circulation in the perineal tissues. Any muscular contraction will increase the pressure, but this muscular effort lacks the stimulus of freely moving fragments of bone, and is moreover repressed by the bandage-like compression of the whole splint. The real pressure on the perinæum is represented by *intermittent* muscular effort, and does not imply ulceration even theoretically. A few cases are adduced to show that ulceration has been produced, but these cases prove absolutely nothing, except the fact that ulceration *may* ensue if the splint is put on too tightly. To maintain this position it would be necessary to show that all cases in which a good result was obtained suffered from ulceration in the perinæum, or else that they were all devoid of the usual tendency to shorten which usually characterizes fractures of this class. I have only seen two cases of ulceration, both hospital cases in the early history of the use of this splint, before much experience had been gained; one case complicated by idiocy, the other a patient who silently endured a chafing of which he should have complained. Except these two cases, I have never known of any difficulty from perineal pressure, although it was not at all uncommon for the patient to complain a little at first. I always found that the removal of a trifle of the edge—especially behind the perinæum, where the upper edge crossed the gluteal fold—sufficed to remove discomfort.

As I shall presently show, I have collected one hundred and fifty cases of fracture of the femur treated with the gypsum splint, at Bellevue and other hospitals, and in private hands, with an average shortening less than one half inch, and the pressure in the perinæum indicated by these results ought to have produced more than two cases of severe trouble, if ulcerative pressure is a *sine*

quâ non of extension. We find nothing said about ulceration of the perinæum by Mr. Erichsen, who, after sixteen years' hospital use of this method, says of it (Lancet): "I have been more satisfied perhaps with the results obtained from it than from any other method of treatment. It requires to be carefully applied, not too tightly, and yet tight enough; hence there is a little difficulty and a little special art in its application, which sometimes interferes with its full utility. Many cases even in the adult have been discharged with scarcely any apparent shortening. I believe that every apparatus that is applied in fracture of the thigh acts very much in the same way. These methods act not by violently influencing the condition of the muscles of the limb, not by putting the muscles of the limb on the stretch, and so overcoming the displacement induced by their forcible contraction, but by keeping up a certain amount of extension, and so, by fatiguing the muscles, causing their insensible relaxation after a few days. After the limb has been put up in the starch apparatus it may be of its proper length, or there may be a little shortening; but at the end of three days the muscles are relaxed, and the limb comes down to the proper length. I believe this is due to the pressure of the bandage, the continuous circular compression of the limb fatiguing and relaxing the muscles, and partly owing to the friction between the limb and the lining of the splint, for this prevents the limb from being drawn up within the splint, if the bandage has been properly applied."

Still looking at the subject from a theoretical standpoint we are met by the objection that the splint rapidly loosens through subsidence of swelling, atrophy of muscles, and absorption of subcutaneous fat, and that with the first signs of loosening the efficacy of the splint vanishes. If the swelling of the limb is *excessive* I hold that the gypsum apparatus should not be applied, partly because there is more apt to be trouble with the deep venous system in these cases, and partly because the subsidence of the swelling is generally rapid, and a new splint will be needed in a day or two. If, however, the swelling be moderate and the splint which at first encircled the limb snugly becomes loose in a week, it does not follow that extension of the limb is lost when we have a rigid band extending up the inner side of the thigh and resting against the rami of the pubes and ischium. The only post-mortem specimen of a fractured femur treated with

the gypsum splint which has been placed on record is of no avail in deciding the question whether the splint maintains any extension or not, for two reasons: first, because the age of the patient (eighty-three) made a perfect result only a secondary consideration, and forbade a judicious surgeon from applying the splint as snugly as might have been done with impunity in a younger man; secondly, because the fracture was so near the cervix femoris that the lower fragment was arrested by it before the degree of excessive shortening was reached which the splint was intended to prevent. The surgeon who contributes the specimen considers the shortening to be three quarters of an inch, and the objector who adduces the case doubts "whether any other plan of treatment would have made the limb any longer."

I have alluded already to a number of cases which I have tabulated, but before adducing them I wish to protest against the rejection of all statistics not verified by the collator. Dr. F. H. Hamilton, in one of his articles on this subject, has refused to accept the measurements taken from hospital record books without selection, and has only admitted those made by himself and others in whom he states he has implicit confidence, and among whom he generously includes the writer. Now, while I do not believe in any man's ability to measure a limb to within an eighth of an inch of the exact length, I do hold that any man who can intelligently treat a fractured femur can measure it afterward with sufficient accuracy to make his record valuable for statistical purposes; and while I yield to none in the conviction that statistics to be valuable must be reliable, I also maintain that, other things being equal, the value of the statistics is in direct ratio to the number of cases; and while five cases, measured to the thirty-second of an inch and sworn to before a notary, would not prove much, one hundred cases, some of which might vary one fourth of an inch from the truth, would go a great way toward establishing a principle. I think therefore that we do an injustice to the surgeons who have taken the trouble to measure their cases and place the results on record if we refuse to accept their records. If this spirit of distrust of each other is to be fostered in our ranks we may as well abandon statistics at once, for the statistics that can be attested by the collator or his personal friends must of necessity be so limited as to be practically valueless.

I claim the right therefore to put in evi-

dence all measurements of fractured femora found in reputable medical literature and in the record books of various hospitals, unless it can be shown that gross carelessness or dishonest statements have vitiated the record. I have personally searched the record books of Bellevue Hospital from 1870 to 1878, of Roosevelt Hospital from its foundation to the present time, and other hospitals in this city and Brooklyn, and collated cases from private sources with a view of ascertaining, first, how extensively gypsum splints have been used in the treatment of fractured thigh; second, what were the results; and, third, in case the results were bad, whether this was to be attributed to an improper selection of cases for its application, or to a faulty application, or to some inherent defect in the splint itself, which should lead to its rejection under all circumstances.

The figures in my former paper show that from the time of introducing this apparatus for treating fractured femur into Bellevue Hospital, which was in 1870, up to February, 1872, fifty cases of this fracture so treated were on record with the results accurately given. This method was then on trial, and the internes were much interested in the subject. The average number of cases of fractured thigh received in Bellevue per year is thirty-six, and we see that fully two thirds of all cases were then treated in this manner. The results of these cases being eminently satisfactory (average shortening one third of an inch) the application was made more universal, and in the following year (April, 1872-73) we find in Dr. Van Wagener's admirably compiled tables that thirty-one cases are recorded with an average shortening of half an inch. At this time the inventive ingenuity of the house staff found exercise in devising aids to the surgeon in applying the splints, and the names of Van Wagener, Bull, and others are attached to mechanical devices whereby labor is saved to the surgeon, discomfort to the patient, and a better fitting splint is attained. From 1873 active interest in this method began to decline. It had been tested for nearly three years and the results were excellent. A case occurred about this time to which reference will be made, in which gangrene and death followed its use, and showed that even in hospitals the method was not free from danger, and this unquestionably diminished the frequency of its use, especially since it had been so amply demonstrated that the treatment gave satisfactory results in com-

petent hands, that, in short, it was no longer on trial, but an accepted plan of treatment. From this time on, then, we find a tendency to return to the continuous extension which was by all means the easiest way of treatment for the internes who were often pressed for time, and lacked the stimulus of the investigating and experimental spirit which animated the earlier workers.

In Roosevelt Hospital since its foundation twenty-one cases have been treated with gypsum splint and seventeen by the extension apparatus. During the past eighteen months two cases have been treated by the gypsum splint and ten cases by the extension plan, six of which received the injury by direct violence, in most cases from the passage of a heavy wheel across the limb.

In St. Luke's Hospital records are seven cases treated by gypsum, of which three were measured and averaged five eighths of an inch shortening. The remaining four are marked "cured." The cases treated by continuous extension also averaged five eighths of an inch shortening.

In the New York Hospital books are seventeen fractured femurs requiring apparatus. Of these five were treated with gypsum splints, four having the splint applied within nine days, and one on the sixteenth day; three are marked "cured," one "very slight shortening," and one left the hospital a few days after application of the splint. Of the cases in which gypsum was *not* used six were from direct violence, crushing under wheels or falling from great heights.

In Chambers-street Hospital the reports of fifteen cases have been kindly furnished me by the attending surgeon, Dr. W. F. Bull. In four of these the application of the splint was delayed beyond two weeks, in one as late as the twentieth day, and in all four the cause of fracture was direct crushing violence. The average shortening on admission was one inch. Stiffness of the knee, present in many cases after removal of splint, yielded in every case in which the patient's history could be traced. Dr. Bull's extensive experience in the use of the gypsum splint is reflected in the results of these cases, no case being more than half an inch short, and the average shortening being one fourth of an inch, while in no case was there any deformity at the time of discharge from hospital. These cases were all fractures of the *shaft* of the femur, which is beyond question the variety in which shortening is prone to occur unless prevented. This series is especially valuable, because it shows with

what uniform success the gypsum splint may be used in this fracture when in the hands of an expert, and these results will bear comparison with any other series of which I am at present aware.

In the Presbyterian Hospital, which has been quoted as not indorsing this treatment, the gypsum splint has not been used in any case, hence the failure to indorse does not rest upon bad results. The only case requiring apparatus treated there during the past three years, and which resulted in one and a half inches shortening, might perhaps have done no worse under the gypsum treatment.

In St. Francis Hospital it has been used in many cases, but the imperfection of the records renders them unavailable. Dr. Edebohls, former house surgeon, has furnished me with two of the cases—a girl of fourteen, who recovered in six weeks, with half an inch shortening, and a boy of nine, who had a compound comminuted fracture of shaft of femur and made a good recovery. (See table.)

I gladly place on record a private case furnished me by Dr. Stewart, of this city, since the doctor at the time had never seen the apparatus applied, and yet succeeded in curing a fracture of the shaft of the bone caused by direct crushing violence, with a shortening of less than half an inch, and with no chafing of perineum or back.

Dr. Marcy, of Cambridgeport, Mass., who has had extensive experience with plastic apparatus, and whose admirable article on the subject has been already mentioned, says: "My experience is that if I could select but one fracture for treatment in this way it would be fracture of the femur, and that for various reasons. In my whole list of fractures of the thigh I do not believe I have had one with three quarters of an inch shortening except the one spoken of in my article."

Dr. Cowling, of Louisville, writes: "It has been almost the exclusive form of dressing used in the treatment of fractures of the lower extremity in Louisville for the last ten years;" and adds "I should say in general terms that in adults one half or three quarters of an inch shortening is the result, but, as no limp is apparent, measurements are seldom made. In children the length of the limb is fully retained.

Dr. Yandell writes: "I have never lost a limb or seen one come out inconveniently shortened where I had used the plastic dressing."

Dr. S. B. Ward, of Albany, writes: "In fractures of the arm and leg, in joint troubles involving the shoulder, elbow, wrist, knee, or ankle, and in which absolute rest is requisite, and in Pott's disease I should hardly know how to get along without plaster dressings," and adds that he has only used it twice in fracture of the femur and without any special advantage over the extension treatment.

In the Brooklyn City Hospital it has only been used in two cases, these being cases which had been treated several weeks with continuous extension, one of them being a case of non-union, the latter, however, uniting promptly after the application of the gypsum splint.

In the University College Hospital, London, I saw it in frequent use in 1872 and 1873 in Mr. Erichsen's wards, and that it is still satisfactory there may, I think, be reasonably inferred from the following extract from Erichsen's Surgery, ed. of 1878: "The starch or plaster bandage may be employed in most cases." Then follows a description of the method of application, and he continues, "With such an apparatus I have treated many fractured thighs, both in adults and in children without confinement to bed for more than three or four days, and with little, if any, shortening or deformity being left. The principal points are that the upper and posterior parts be very strong, and that the spica be well and firmly applied."

That the method still finds favor in Germany, where it has been tested longer than in any other country, may be seen from the following criticism of Dr. Hamilton's work on Fractures and Dislocations, the German translation of which has just appeared. I quote from the columns of the Deutsche Zeitschrift für Chirurgie: "The inventive faculty of the Americans has given much that is valuable to surgery, but they do not sufficiently appreciate plastic apparatuses, especially the plaster bandage. Splints are generally more difficult to apply, require daily replacement, and do not always avoid gangrene. . . . At all events, judging from the admissions of the author, fractures of the femur generally heal with shortening, while we, by means of the gypsum bandage, up to the present time, generally cure them without shortening." This last statement I take *cum grano salis*, and consider it based upon a general impression rather than upon statistics, but the expression serves well to show the degree of favor it continues to hold among the German people after a trial of twenty years.

In the Archives für Klinische Chirurgie Von Langenbeck's clinic reports for last year twenty-five cases of fractured femur, mostly of children under eleven years. Of these, fourteen were treated with extension at first and generally after a short time with a plaster apparatus; eleven were treated with plaster alone. There was no trouble in any case, but in some of the cases the union was remarkably rapid, about equally divided among plaster, mixed, and extension treatment. Measurements of these cases are not given, they are simply reported as good results.

In the great work of Billroth and Von Pitha I find the following: "The best apparatuses for permanent extension and counter-extension are those made of gypsum or gutta percha, which, when well applied, embrace the limb so closely that a return of the faulty position is impossible, and by means of which the necessary pressure is distributed over the entire surface of the limb and not allowed to come upon isolated points."

Prof. Lücke, of Strasburg, in answer to a letter asking what was the favorite method of treating fractures of the thigh in Germany, sends the following courteous reply: "In Germany there are at present only two methods in favor with clinical teachers: 1. The gypsum bandage; 2. The permanent extension with weights or elastic straps. I personally prefer the former, and have always been satisfied with the results in my public and private practice, provided that the fracture be thoroughly reduced. The method I have used for several years is as follows, and it is essentially the same as that in use by many surgeons here: 1. The bandage is to be applied as soon as possible; 2. Some special device is used to support the patient in convenient position while applying the splint (Volkman's, Rosa's, Lücke's, etc.); 3. Extension is to be kept up until the splint is hard, by the weight and pulley after the patient is placed in bed; 4. The splint is renewed at the end of a week, on account of subsidence of swelling and atrophy of tissues; 5. None of us have met gangrene where the splint was applied as is taught in all our clinics. In case great extravasation of blood is present, of course no gypsum bandage should be applied at once; 6. For country practice the extension method is the best, though in my opinion it is not free from danger. The results of the gypsum bandage have been with us thoroughly satisfactory."

To this positive testimony may be added the negative evidence of absence of records of injury from or bad results following the

use of the method; for while such cases would not find their way into print so readily as successes, we may fairly assume that their frequent occurrence would have elicited protests from some quarter.

We see then that the highest American, English, and German authorities unite in strong commendation of this form of apparatus which has been pronounced worthless by high American authority. Let us now look for a moment at the recorded results.

In my paper of 1872 I collected fifty cases from Bellevue Hospital records, with an average shortening of one third of an inch. Dr. Van Wagenen took up the records where I left off, and from the books of the following year gave the profession thirty-one cases with an average shortening of half an inch. From that point (April, 1873) I have collected all cases in Bellevue Hospital records in which gypsum was used within the first two weeks, and in which a record of the shortening at the time of discharge is given, and find thirty-two cases which have an average shortening of slightly less than three fourths of an inch. There are also twenty cases treated by the gypsum apparatus recorded as "good," "no deformity," "but little shortening," "cured," etc., but these, of course, do not serve the purposes of the statistician.

In the American Practitioner for July, 1870, Dr. Yandell details ten cases of fractured thigh in which a plastic apparatus was applied at once, of which eight united without shortening, one with one fourth inch, and one in which both thighs were broken could not, of course, be measured. In the last case the extension by weight and pulley was also used, and curiously enough it is the only one of the series in which deformity is mentioned. If we add these to our list we have a total of one hundred and fifty-six cases in which we have the recorded results, cases taken from hospital record books and from the private records of responsible surgeons.

To recapitulate, we find in Bellevue Hospital one hundred and thirteen cases, with an average shortening less than one half inch; in Roosevelt Hospital thirteen cases, with an average shortening less than five eighths inch; in St. Luke's Hospital three cases, with an average shortening less than five eighths inch; in Chambers-St. Hospital fifteen cases, with an average shortening less than one fourth inch; other sources, twelve cases, with an average shortening less than one fourth inch; or a total of one hundred

and fifty-six cases, with an average shortening less than one half inch.

A small number of bad results following the use of the gypsum splint for fracture of the femur have been recorded, and they should be carefully studied to see whether the results were inseparable from the method used, or whether they arose from an abuse of the method in applying it to improper cases; in managing the apparatus wrongly; in not watching it with sufficient care; or lastly, whether the cause may not be found in some entirely foreign factor.

All new methods of treatment, especially if capable of extensive application, have a critical period to pass through, and the danger comes mainly from friends rather than enemies. Under the excessive caution and carefulness which attend the use at first the method gains favor, accidents are avoided, and the results are good; but familiarity leads to over-confidence, and even in the hands of experts a really good method may be attended with disaster. This is, however, comparatively rare, and we find the greatest danger from the use of the treatment in the hands of those who, while favorable to it, have had little or no experience with it; who are unfamiliar with the contraindications for its use and with the dangers to which it is liable, but who, having heard of the brilliant success attending its use in large hospitals, use it without proper precautions. These dangers are well illustrated in the following cases:

The first case, I believe, has not yet appeared in print. It is taken from the Bellevue Hospital records for 1872. A man of sixty; fracture of middle of femur; was etherized and had gypsum splint applied on second day. The next day the records note, "The circulation of the foot did not recover itself by night, but this morning seems good." Next day, "Complains of great pain behind knee and foot. Splint cut longitudinally as far as middle of thigh, and failing to relieve was removed." In spite of hot applications, electricity, and friction, sloughing of dorsum of foot and toes set in, deep suppuration in leg, and death followed in thirty days from injury. This case was in the hands of experienced and careful men, and I can only account for the result by supposing that much immunity from accident had thrown them off their guard, or possibly a sudden press of work drew off their attention. One point, however, I must criticise, viz. the section of the *lower* part of the splint. The failure of the circulation to restore itself by

night, presumably several hours, at least after the application, should, I think, have called for *complete* section, certainly not for section of the *lower* part which could only make matters worse.

The second case, a man of twenty-three, run over by a loaded truck, the wheel passing over the thigh and producing a comminuted fracture, was received into Ninety-ninth St. Hospital, and the records show that there was *no pulsation in the post-tibial artery*. A gypsum splint was applied, gangrene set in, death ensued, and the post-mortem showed that the popliteal artery was choked with clots. This case has been gravely classed as a death due to the splint,* and explained by asserting that the interruption to the superficial venous circulation removed the only chance left for vitality, but the situation was certainly one which would render gangrene liable under any circumstances, and we are not justified in ascribing the death to the splint, though unquestionably it was not a fit case even for coaptation splints, until the state of the circulation was assured.

The third case, a woman of twenty-four, Bellevue, 1873; gypsum splint same day; next day the toes dark, and bandage on foot to the bottom of the splint was removed and *lower part* of splint cut open. The next day the "whole surface of the body had a cyanotic look." Death ensued, and autopsy showed "thrombi of iliac veins, pneumonia of both lungs, fatty kidneys, ulcerations in intestines, rupture of one ovary, and hemorrhage into pelvic cavity with emboli of middle cerebral and basilar arteries." Here, although the splint, without question, interrupted the circulation dangerously, and relief was attempted in the same ineffective way by section of the *lower* part, the autopsy showed that there were serious internal lesions which render it by no means a clear case for classifying, as has been done, among fatal cases due to gypsum apparatus.

The fourth case, a man of sixty-two, had heart disease for twenty-eight years, on admission had fracture of cervix femoris, gypsum splint on fourth day, pulse weak and irregular. On sixth day splint removed because it had excoriated the skin over the sacrum. All the extremities were cold and blue, dyspnoea set in, lungs became emphysematous, and he died. This is a case where death is ascribed to the splint;† but I leave it for some more ingenious man than myself to say how a splint which caused no local

symptoms beyond a sore over the sacrum caused the death of a man who had long-standing heart disease, and who suffered at the last with marked emphysema of lungs.

The fifth case was in private practice, a girl three and a half years, who fell about twenty feet, and had an oblique fracture of femur at middle. There was considerable swelling, and after eight days the splint, which had become loose, was opened and tightened up. After four weeks the splint was removed, thigh found somewhat bent, and shortened about one inch. Under the circumstances it was deemed best to re-fracture, which was done, and a better result gained under extension treatment. This case was under the care of an excellent and careful man, whose experience with the gypsum splint in fracture of the femur was limited to this case, and I conceive the bad result due mainly to opening and tightening up the apparatus when it became loose, instead of removing it and applying a new one.

It would, however, far transcend the limits of this paper to take up in detail *all* bad cases under *any* line of treatment. For the instruction of those who suppose that gypsum splints are responsible for all the bad cases, I will say that in the Bellevue Hospital records, for the past five years, I find thirty-two cases of fracture of femur treated by the extension method, where the measured result is given, and the average is three fourths of an inch shortening (the average of eighteen cases in which the shaft was broken being the same), and that in the list occur instances of shortening of two and a half, one and five eighths, two inches, etc., cases of angular deformity, a case of stiff knee, where the femur was re-fractured in trying to bend it, etc. I transcribe these from my notes not to show that the extension plan is a bad one, but to prove that any plan must fail in a certain number of cases, and if the cases are followed up the cause may often be found not to lie in the method of treatment.

One case more I can not forbear adducing which has been classed as a death due to the method of treatment,‡ where the patient died from food passing into the bronchi during vomiting, caused by ether, the objector remarking "It has been almost the constant practice of late to employ ether and the pulleys while applying the plaster, and this is considered one of the great essentials to success." On this point I call attention to my paper of 1872, where twelve of the fifty cases were not etherized (average shortening

* Hamilton on Fractures and Dislocations.

† Hamilton, op. cit.

‡ Hamilton, op. cit.

one third inch), and in which I say distinctly "the use of an anesthetic does not seem to have essentially altered the result," also to the fact that nine of Van Wagenen's cases were without ether, with an average shortening less than half an inch, and to the fact that Mr. Erichsen does not use an anesthetic as a rule, and on the continent it is not considered essential. With twenty-one recorded cases with such good results I think it can not be said that ether is one of the great essentials to success.

Those who do not indorse this method of treating fracture of the femur lay great stress upon the fact that in some hospitals where it was formerly used in almost all cases it is now used only occasionally, and argue that this shows it to be a failure. This, however, is merely begging the question. I have already shown that the frequency with which a form of dressing is used depends largely upon the interest excited by it as a novelty, and upon the desire to test its efficacy and to vary its details. After the disappearance of these factors the frequency of its use depends largely upon minor details, such as the readiness of application, care in management, etc. Now since the application of a plastic thigh splint amounts almost to the rank of an operation, occupying more than an hour, sometimes involving the administration of ether; since it requires most careful watching afterward, and in some cases has to be reapplied within a few days, while a continuous-extension apparatus can be put on in fifteen minutes, and does not require such close watching, I think it very natural that the latter, with its proved efficacy should gradually, in a large hospital, supplant the former when experimental interest in gypsum treatment had subsided. I have already said that search of the records shows quite as many cases of shortening and deformity with the extension as with the gypsum splint, and the average result of the one hundred and fifty cases tabulated elsewhere prove, as far as statistics can prove any thing, that the method is reliable in experienced hands. How many cases of fracture of the thigh can be found in New York hospitals treated by suspension (Smith-Hodgen plan)? and yet have we any right to say that a plan which has been used with such success, and has received the indorsement of such eminent men, is a failure because we do not use it extensively? I deprecate exceedingly the spirit which belittles and despises every thing which is not a favorite with the author, and which leads to such inconsiderate use of lan-

guage as we find in a late article by a distinguished surgeon who says, in speaking of the ability of plaster splints to maintain extension, that "the proposition is too absurd to deserve serious consideration." When we remember that this intemperate language is used about a procedure indorsed by such men as Von Langenbeck, Billroth, and Erichsen, after twenty years of trial, and that it is the language of one who admits that he has used it with success in fracture of the thigh in children, but has had no experience whatever with it in adults, we may well believe that surgical criticism is losing its effect by reason of the insufficiency of its foundations.

We come now to the most interesting and practical part of the subject, the question, in what cases may we use the plastic splint? I think that as regards simple and uncomplicated fractures of the extremities, if we except fracture of the femur, the majority of our representative New York men would advocate its use after the first few days at least. Indeed, I think a large and influential part of them would indorse its immediate application in simple fractures by indirect violence, and I must confess to not a little surprise at learning that at our newest hospital the usual apparatus for the first few days was the antiquated fracture-box. In the management of bad compound fractures the gypsum splint finds hearty indorsement, even at the hands of those who look with disfavor upon it in most other cases, while, as a means of support in chronic cases, ununited fractures, sprains, etc., its value is undisputed.

In fracture of the *femur* it has the indorsement of such men as Billroth, Esmarch, Von Langenbeck, Lücke, Volkmann, of Germany, Erichsen, of England, Sands, Stephen Smith, Sayre, Howe, Weir, Sabine, and many others of New York. The reasons why it is shunned by many good surgeons I conceive to be mainly (1) a distrust in its ability to maintain extension, (2) a fear that the fragments may get out of line if they are concealed, and (3) a fear of gangrene from constriction. I have already given my theoretical views on the former, and practical suggestions for avoiding this danger. The second objection does not hold if extension is maintained, but if the splint is allowed *early in the treatment* to become so loose as to allow of the hand being run down between it and the thigh there would probably be this danger. On the third point, the danger of gangrene, I have already dwelt at some length.

I think that all these dangers may be avoided by observing the following rules:

1. Never to apply the splint so long as any doubt exists as to the integrity of the deep arteries and veins; 2. In all cases where crushing violence has caused the injury to wait until the maximum swelling has been reached; 3. To make the state of the circulation, as tested by the capillaries of the toes, paramount to every thing else for the first forty-eight hours, and in case of decided sluggishness for more than two hours to make a *complete* section of the splint at once. To these rules for the application may be added the following for its management: 4. Never cut away the splint on the inside of the thigh, except the trifle that may require removal to prevent excoriation if it has been put on too tightly; 5. If the splint becomes loose do not attempt to take up slack by removing a section, but remove it and apply a new one.

It will be seen that my object in this paper is simply to establish for the plastic treatment of fractured thigh a place in our surgery, and to controvert the idea that in adopting it we took a step backward. I am glad to be able to record, in this revision of the paper for the press, the recession of Dr. Hamilton from the position previously mentioned, that "with it the limb shortens as much as it is possible for it to do," and to call attention to the fact that the imperfections of hospital records which he dwells upon are, so far as these statistics are concerned, simply *omissions*, and that when a measurement *is* given it is as valuable, so far as it goes, as if all cases were thus recorded. I have in my tables rejected all cases in which the measurements were not expressly and definitely given. In view of the fact that it is now generally admitted that there is a normal difference in length between the two femora, sometimes in favor of the left and sometimes of the right, does it not seem unreasonable to claim that the question of the results of fracture of the thigh is "no longer a question of inches, but of lines." And in comparing different methods of treatment is it right to compare the results of cases treated under several surgeons, some of whom had no especial interest in the subject, with cases from the wards of a surgeon who has for years had a peculiar interest in the subject, and is in the habit of giving his hospital patients the benefit of his personal attention to the adjustment of the apparatuses? While I have not invited comparison I am willing to place the results of cases treated with gypsum side by side with cases treated by any other method under similar

conditions, and while I admire, as much as any one, Dr. Hamilton's remarkable series of cases treated by extension, published in the Archives of Clinical Surgery, May 30, 1878, I invite comparison of it with the series given in this paper, treated by Dr. Bull at Chambers St. Hospital.

That grave accidents are more likely to occur under its use by the profession at large than with the extension plan I am ready to admit, as also the fact that the care and anxiety to the surgeon is greater, but I have seen too much of the advantages of the method to permit these avoidable dangers to deter me from its use. The successful use of the method requires more caution, more judgment, more surgical skill than the extension treatment, and should be shunned by those surgeons who are not willing or able to give the treatment of the case an abundance of all these three factors.

In 1872 I ventured to recommend gypsum apparatus as a dressing for fractured ribs on account of its vertical stiffness, not crumpling up as does the adhesive plaster. My experience then rested on a single hospital case, but I have since used it in private practice with great satisfaction. The application resembles exactly that of the plaster jacket used by Dr. Sayre for spinal disease, except that it requires no suspension and does not cover the abdomen.

The use of plastic apparatus in the treatment of spinal disease has been so thoroughly presented to the profession by Dr. Sayre that a mere mention of its use is all that will be appropriate here.

I maintain then that plastic apparatus affords an efficient and reliable means of treating almost all fractures and diseases of the bones and joints; that in the hands of experienced men it is comparatively free from danger; that cases not infrequently arise, especially in private practice, where no other form of apparatus will answer as well, *e. g.* in nervous, irritable persons who do not bear confinement to bed with composure, or delirious persons who have recent fractures, and that it deserves a front rank in our list of surgical appliances. In fractures of the thigh especially, it may not be as safe in the hands of the tyro as some other reliable method, but this I hold to be no reason why it should be indiscriminately condemned. Its results as tested on an extensive scale are, in good hands, equal to those of any other method, and we ought to welcome it as a valuable addition to our list of surgical appliances.

CASES OF FRACTURE OF THE THIGH TREATED AT BELLEVUE HOSPITAL WITH GYPSUM SPLINTS, FROM
APRIL, 1873, TO JANUARY, 1878.

No.	Name.	Sex.	Age.	Cause of Fracture.	Point of Fract.	Date of Application of Splint.	Time of Healing.	Result. Amount Short.	REMARKS.
1	J. D.....	M	38	Dir. vio.	Ab. condyles.	6th d...	2 mos.	1 inch.	No deformity.
2	J. W.....	M	8	Dir. vio.	Up. & mid. 3d	3d d...	7 wks.	1 inch.	
3	O. M'L...	M	30	Dir. vio.	Lower 3d....	11th d.	53 dys.	1 inch.	
4	F. H.....	F	48	Ind. vio.	.....	3d d...	8 wks.	None.
5	G. T.....	M	25	Middle.....	1st d...	6 wks.	1/2 inch.	Splint did not harden.
6	T. L.....	M	14	Ind. vio.	Middle.....	2d d...	4 wks.	1 inch.	
7	M. B.....	M	28	Dir. vio.	Lower 3d....	2d d...	2 mos.	1 1/2 inch	
8	M. M.....	M	33	Ind. vio.	Below troch.	1st d...	7 wks.	1/2 inch.	
9	J. G.....	M	50	Ind. vio.	Cerv. ext.cap.	2d d...	5 wks.	1 inch.	Ether given.
10	B. O'B...	F	35	Ind. vio.	Middle.....	11th d.	6 wks.	None.	
11	F. K.....	F	5	Ind. vio.	Shaft up. and mid. 3d....	3d d...	5 wks.	None.	No deformity.
12	M. B.....	F	2	Ind. vio.	Middle.....	1st d...	5 wks.	None.	
13	E. K.....	M	70	Ind. vio.	Cerv. ext.cap.	5th d...	8 1/2 wks	1 1/2 inch	Patient ordered to stay in bed, and on 8th day a V shaped piece was cut out on inner side of thigh to take up slack.
14	J. B.....	M	47	Ind. vio.	Middle.....	3 d...	7 wks.	1/2 inch.	
15	D. W.....	M	58	Ind. vio.	Cervix.....	7th d...	8 wks.	1 1/2 inch	
16	L. M.....	M	26	Ind. vio.	Middle.....	2d d...	6 wks.	1/2 inch.	
17	O. C.....	M	33	Ind. vio.	Below troch.	2d d...	7 wks.	1 1/2 inch	Ether used.
18	J. M.....	M	39	Ind. vio.	Shaft middle and upper 3d.	3d d...	5 1/2 wks	some bowing	
19	F. M.....	M	5	Dir. vio.	Lower 3d....	2d d...	5 wks.	1/2 inch.	
20	H. H.....	M	7	Dir. vio.	.....	1st d...	6 1/2 wks	1/2 inch.
21	E. M.....	M	39	Ind. vio.	1st d...	6 wks.	1/2 inch.	Case of refracture.
22	J. H.....	M	18	Ind. vio.	.....	1st d...	4 1/2 wks	None.
23	M. K.....	F	52	Ind. vio.	Cerv. ext.cap.	7th d...	7 wks.	1/2 inch.	Ether used.
24	C. S.....	M	9	Dir. vio.	Low. & mid 3d	9th d...	6 wks.	1/2 inch.	
25	W. G.....	M	7	Ind. vio.	Lower 3d....	8th d...	6 wks.	1/2 inch.	Ether used.
26	P. L.....	M	50	Ind. vio.	Middle.....	6th d...	6 wks.	1/2 inch.	
27	J. D.....	M	25	Ind. vio.	Lower 3d....	11th d.	8 1/2 wks	1/2 inch.	
28	T. H.....	M	4	Dir. vio.	Middle.....	11th d.	6 wks.	1/2 inch.	
29	J. T.....	M	43	Ind. vio.	Upper 3d....	5th d...	8 wks.	1/2 inch.	Original shortening 1 1/2 inch.
30	O. H.....	M	5	Dir. vio.	Middle.....	2d d...	3 wks.	1/2 inch.	
31	J. M.....	M	39	Dir. vio.	Middle.....	1st d...	4 1/2 wks	1 inch.	
32	J. L.....	M	9	Ind. vio.	Mid. and up.	10th d.	6 wks.	1 1/2 inch.	

CASES TREATED AT ROOSEVELT HOSPITAL FROM OCTOBER, 1873, TO FEBRUARY, 1878.

No.	Name.	Sex.	Age.	Cause of Fracture.	Point of Fract.	Date of Application of Splint.	Time of Healing.	Result. Amount Short.	REMARKS.
33	J. C. F...	M	40	Ind. vio.	Mid. & up. 3d	1st d...	6 wks.	3/4 inch.	Shortening before fracture 3/4 inch.
34	M. C.....	M	7	Dir. vio.	Upper 3d....	1st d...	6 wks.	1/2 inch.	
35	T. W....	M	35	Dir. vio.	Lower 3d....	13th d.	5 wks.	1 inch.	Great swelling, condyles separated, and shaft driven between them.
36	S. R.....	F	32	Dir. vio.	Middle.....	2d d...	3 mos.	3/4 inch.	
37	W. S....	M	32	Ind. vio.	Middle.....	1st d...	4 1/2 wks	1 inch.	Fell and refractured thigh. Original shortening 1 1/2 inch.
38	M. P.....	F	2	Dir. vio.	Middle.....	1st d...	2 1/2 wks	1 inch.	
39	J. F.....	M	7	Dir. vio.	Middle.....	2d d...	4 wks.	1 inch.	Ether used. Narrow section of splint removed anteriorly.
40	C. J.....	M	38	Dir. vio.	Cerv. ext.cap.	12th d.	6 wks.	1 1/2 inch	
41	A. H.....	M	4	Dir. vio.	Middle.....	10th d.	4 1/2 wks	1 inch.	Not good union; foot somewhat everted. Original shortening 1 3/4 inch.
42	G. D.....	M	17	Dir. vio.	Middle.....	9th d...	6 wks.	1 inch.	
43	W. M....	M	6	Dir. vio.	Middle.....	1st d...	6 wks.	1 inch.	Had also fractured humerus and rib. Original shortening 1 1/2 inch.
44	J. K.....	M	20	Dir. vio.	Mid. & low. 3d	1st d...	5 1/2 wks	1 inch.	
45	P. Q.....	M	34	Dir. vio.	Mid. & low. 3d	2d d...	6 wks.	1 inch.	Ether. Original shortening 1 1/2 inch.

CASES TREATED AT CHAMBERS ST. HOSPITAL UP TO MARCH, 1878.

No.	Age.	Cause of Fracture.	Point of Fract.	Shortening on Admittance.	Date of Application of Splint.	Time of Healing.	Result. Amount Short.	REMARKS.
46	18	Ind. vio.	Middle.....	None.....	2d d...	4 wks..	None.	No anchylosis or deformity.
47	3	Dir. vio.	Mid. & up. 3d	2 inch.....	5th d...	26 dys.	None.	No anchylosis or deformity.
48	5	Ind. vio.	Lower 3d....	1½ inch.....	5th d...	28 dys.	½ inch.	No anchylosis or deformity.
49	7	Ind. vio.	Mid. & low. 3d	1 inch.....	5th d...	29 dys.	None.	No anchylosis or deformity.
50	7	Ind. vio.	Upper 3d....	1 inch.....	5th d...	28 dys.	None.	No anchylosis or deformity.
51	7	Dir. vio.	Mid. & up. 3d	2 inch.....	16th d.	47 dys.	½ inch.	No anchylosis. Patient out after 10th d.
52	15	Dir. vio.	Middle.....	1½ inch.....	11th d.	55 dys.	None.	No deformity. Stiffness of knee 10 days.
53	25	Dir. vio.	Mid. & low. 3d	½ inch.....	9th d...	56 dys.	None.	No deformity. Slight stiffness of knee for 2 months.
54	37	Dir. vio.	Middle.....	1½ inch.....	20th d.	36 dys.	½ inch.	No deformity. Temperate anchylosis.
55	49	Dir. vio.	Mid. and low.	1¾ inch.....	13th d.	38 dys.	½ inch.	No deformity. Some stiffness of knee when dismissed.
56	50	Dir. vio.	Upper 3d....	¾ inch.....	14th d.	42 dys.	½ inch.	No deformity.
57	50	Dir. vio.	Mid. and low.	¾ inch.....	15th d.	37 dys.	None.	
58	53	Dir. vio.	Mid. and low.	¾ inch.....	7th d...	44 dys.	½ inch.	Temperate anchylosis.
59	39	Dir. vio.	Middle.....	1 inch.....	11th d.	38 dys.	None.	No deformity. Temperate anchylosis.
60	25	Dir. vio.	Mid. & low. 3d both femora.	None.....	4th d...	53 dys.	None.	Limbs of equal length; no deformity, slight anchylosis which has since disappeared. Seen 6 mos. later: slight lateral deformity on left side from walking too much on removal of splint. No shortening.

CASES FROM SCATTERED SOURCES.

No.	Name.	Sex.	Age.	Cause of Fracture.	Point of Fract.	Date of Application of Splint.	Time of Healing.	Result. Amount Short.	REMARKS.
61	J. D.....	M	48	Dir. vio.	.....	2d d...	7 wks..	2 inch.	Large, irregular callus; overriding of ends of bone, some bowing inwards.
62	Th. B...	M	61	Ind. vio.	Cervix... ..	18th d.	10 wks	½ inch.	
63	G. L.....	M	49	Ind. vio.	Lower 3d....	11th d.	8 wks..	.....	No deformity, but 1 inch longer than before fracture; refracture.
64	I. B.....	M	29	Dir. vio.	Mid. & low. 3d	5th d...	8 wks..	None.	
65	L. G.....	F	14	Ind. vio.	Upper 3d....	10th d.	7 wks..	½ inch.	
66	W. G....	M	4	Ind. vio.	Middle.....	2d d...	5 wks..	None.	
67	M. M'C.	F	9	Ind. vio.	Lower 3d....	1st d...	6 wks..	½ inch.	
68	— L.....	M	6	Ind. vio.	Middle.....	1st d...	6 wks..	None.	
69	.....	F	13	Ind. vio.	Middle.....	1st d...	7 wks..	None.	
70	M. M....	F	11	Dir. vio.	Middle.....	1st d...	5 wks..	None.	
71	.....	M	30	Dir. vio.	Both nr. mid.	1st d...	8 wks..	.....	Slight deformity of right.
72	.....	M	9	Dir. vio.	Middle.....	1st d...	.....	None.	
73	.....	M	9	Ind. vio.	Middle.....	1st d...	.....	None.	
74	.....	M	22	Dir. vio.	Upper 3d....	1st d...	6 wks..	None.	
75	L. W. C.	M	30	Dir. vio.	Middle.....	2d d...	3 mos..	½ inch.	

Correspondence.

LARGE AND SMALL DOSES OF QUININE.

To the Editors of the Louisville Medical News:

I have been engaged in the practice of medicine in a malarial district for more than twenty-five years, and can bear testimony to the inestimable value of quinine in the treatment of intermittent, remittent, congestive, and pernicious fevers, as well as many other

maladies the symptoms of which that protean and subtle agent, malaria, is apt to assume. In the treatment of ordinary cases of intermittent and remittent fevers, after such preparatory treatment as may be indicated in each case, I have found that fifteen to twenty grains of quinine, divided into six or eight doses, and given during the apyrexia, one every hour if the time is short or doubtful, or one every two hours if we have plenty of time, is sufficient to inter-

cept the chill in intermittent fever, or the paroxysm of fever in the remittent form.

I frequently combine the quinine with one and a half to two grains of opium, or its equivalent of morphia, if there be no contra-indication to its use, and think its efficacy enhanced thereby, in adult cases. If aware of the time of accession of the next chill or paroxysm of fever, I prefer to give the medicine so that the patient shall have taken the last dose one hour previous to its expected return. In the cases of laborers, and in all cases of necessary exposure, a second course of quinine should be taken twenty-four hours after the first, if the case be remittent fever or quotidian ague, or forty-eight hours if it be of the tertian type, etc. In fevers of the congestive and pernicious types the dose and quantity of quinine should be increased in proportion to the gravity of the case and the danger to be averted. In such cases I have given perhaps not less than thirty nor more than forty-five grains in a space of time varying from six to twenty-four hours, according to the probabilities of each individual case, with the happiest results.

In the treatment of periodical headache, intermittent and remittent neuralgia, coryza, ozena, etc. such quantities of quinine as are recommended for the milder forms of malarial fevers will prove sufficient.

I would therefore suggest that the herculean doses and quantities of quinine administered by some physicians are unnecessary in the treatment of ordinary disease; that they tend greatly to the discomfort of the patient producing sometimes at least temporary deafness and disgust for the remedy in future, to say nothing of the waste of that invaluable medicine, the scarcity and price of which seem to be constantly upon the increase.

WILLIAM SPEIR, M. D.

MONROE COUNTY, GA.

To the Editors of the Louisville Medical News:

There is an excellent opening for a drug-store in a town just starting in a thickly-settled neighborhood in southern Kansas, sixteen miles from the Santa Fe Railroad, on the Little Arkansas River. A railroad will be built in a few months to pass by the town. A competent druggist, with a small capital, can do well there if he goes at once. Extraordinary inducements are offered by the town authorities. Address

"PHYSICIAN,"
188 Third Street, City.

Miscellany.

ABSTRACT OF SANITARY REPORTS RECEIVED DURING THE PAST WEEK UNDER THE NATIONAL QUARANTINE ACT:

OFFICE SURGEON-GENERAL, U. S. M. H. S., }
WASHINGTON, September 21, 1878.

Vicksburg. Epidemic abating. There were one hundred and twenty-one deaths during the week ended yesterday evening, a decrease of one hundred and thirteen deaths from the week before. Eleven deaths occurred in the last twenty-four hours. Total deaths to date, seven hundred and twenty-one.

New Orleans. During the week ended yesterday noon there were fourteen hundred and one cases of *yellow fever* and four hundred and forty-five deaths, a decrease of one hundred and seventy-two cases and eighty-five deaths as compared with previous week. In the last twenty-four hours reported there were one hundred and sixty-five cases and sixty-nine deaths. Total cases, seventy-five hundred and thirty-eight; deaths, twenty-three hundred and sixty-eight.

Baton Rouge, La. The first case of *yellow fever* reported to the board of health occurred on the 14th of August. A previous case, not reported to the board, but thought to have been *yellow fever*, occurred August 10th. First death, August 18th. To 9 A. M. yesterday there had been six hundred and seventy-two cases and thirty-nine deaths.

Morgan City, La. During the week ended yesterday evening there were forty-one cases of *yellow fever* and ten deaths, making in all sixty-six cases and eighteen deaths.

Mobile, Ala. Four cases of *yellow fever* and two deaths occurred during the past week, making in all six cases and four deaths.

Grenada, Miss. For the week ended yesterday evening there were twenty new cases and thirty-seven deaths. Total deaths to date, two hundred and seventy-one. No decrease in virulence of the fever. Dr. Henry Stone, of Natchez, is the only physician on duty.

Pass Christian, Miss. From September 9th to 20th, A. M., there were six new cases of *yellow fever* and no deaths. Total cases, twenty-one; deaths, one.

Biloxi, Miss. Twenty cases of *yellow fever* and seven deaths have occurred to 20th September.

Ocean Springs, Miss. There were fourteen cases of *yellow fever* and three deaths for the week ended yesterday evening. Total cases, fifty-one; deaths, twelve.

Memphis. Six hundred and twenty deaths from *yellow fever* occurred during the week ended Thursday evening, September 19th, making a total of twenty-one hundred and thirty-one. The number of cases not known to Memphis Board of Health.

Brownsville, Tenn. During the week ended yesterday evening there were one hundred new cases of *yellow fever* and fifteen deaths, making in all one hundred and thirty cases and forty-four deaths. The deaths for the week ended September 14th were twenty-nine, instead of nine, as stated in last report.

Hickman, Ky. Forty-two deaths from *yellow fever* occurred during the week ended yesterday evening. Sixteen new cases and three deaths during the past twenty-four hours. Total cases to date, two hundred and five; deaths, seventy-four.

St. Louis. During the past week there were six deaths from *yellow fever*, four of which were at quarantine; all refugees.

Louisville. Eighteen cases of *yellow fever* and eight deaths for the week ended yesterday evening. Total cases, seventy-seven; total deaths, twenty-six; all refugees.

Cincinnati. Five cases of *yellow fever* and one death during the week ended yesterday evening; all refugees. Total cases, thirty; deaths, thirteen.

Gallipolis, Ohio. Since the last report, to September 18th, there was one new case of *yellow fever* and three deaths, making in all twenty-eight cases and twelve deaths, all traceable to the steamer John D. Porter.

Indianapolis, Ind. One refugee died of *yellow fever* September 17th.

Bay St. Louis, Miss. Fifteen new cases of *yellow fever* occurred during the last week. Deaths not reported.

Cairo, Ills. Three new cases *yellow fever* since last report. Two died in Cairo, and one went to Mound City, eight miles from Cairo, and died there.

Havana. Fifty deaths from *yellow fever* and four from *small-pox* during the week ended September 14th.

Key West, Fla. Six cases of *yellow fever* and five deaths during the past week.

Morocco, Africa.—Asiatic cholera has appeared in the cities of Mequinez and Fez, Morocco, causing the death of from twenty to thirty victims daily in the former city, which is about one hundred and seventy miles from Tangier. Information of the disease came to Felix A. Mathews, consul of the United States at Tangier, and in his capacity as president of the board of health of Morocco, he dispatched Dr. Tadeo Mar-

tinez, formerly of the Spanish navy, to visit Fez and Mequinez. Dr. Martinez left Tangier August 7th, with an escort of two hundred Moorish troops, and, after forcing his way through the lines of revolutionists besieging Mequinez, entered the city on the 14th of August, where he found the disease to possess all the well-known characteristics of Asiatic cholera. From a report obtained from the custodian of the Jewish cemetery the number of deaths of the Israelites since the first appearance of the disease exceeded four hundred. The disease was reported to have spread to Sherarda, a province bordering on the city of Mequinez. Dr. Martinez attributes the disease to the unsanitary condition of the city, but Consul Mathews suggests the possibility of the germs of disease having been brought by the thousands of pilgrims returning from Mecca. The unsanitary condition of the crowded cities of Fez and Mequinez is described as "entire want of precautionary measures of cleanliness within and without the houses. In some quarters offals, filth, dead animals, and dirt of all kinds and origin are allowed to accumulate from year to year until they reach the level of the windows, creating inexpressibly repugnant exhalations of the most deadly and life-destroying miasm." The port of Tangier and its environs are free from any infectious disease.

Calcutta. Nine deaths from *cholera* week ended July 20th.

Bombay. Thirty death from *cholera* week ended July 30th.

JOHN M. WOODWORTH,

Surgeon-general U. S. Marine Hospital Service.

CLINICAL THERMOMETER.—Medical Times and Gaz.: Sir Humphry Davy in his young days assisted Dr. Beddoes, who at that time was bent on curing all diseases by the inhalation of gases. It so happened that Davy was accustomed, before applying the inhaler, to ascertain the temperature by placing a thermometer under the tongue. While thus employed on a countryman, who fancied this was the wonderful process he had heard of, the man exclaimed that he already felt better. Davy took the hint, left the thermometer in its place some time, and reapplied it every morning. His patient improved in health, and ultimately got quite well without any other treatment.

THE Kilkenny-cat-like habitudes characteristic of our colleges, schools, and hospitals.—*London Lancet*.

SUMMARY OF ADMISSIONS IN YELLOW-FEVER HOSPITAL DURING WEEK ENDING SEPTEMBER 21, 1878, WITH TABLE SHOWING TEMPERATURE AND PULSE.

DATE OF AD- MISSION.	NAMES.	AGE.	COLOR.	SEX.	MARRIED OR SINGLE.	RESIDENCE.	TEMPERATURE.						PULSE.						DIED.
							Sept. 16.	Sept. 17.	Sept. 18.	Sept. 19.	Sept. 20.	Sept. 21.	Sept. 16.	Sept. 17.	Sept. 18.	Sept. 19.	Sept. 20.	Sept. 21.	
							Morn.	Eve.	Morn.	Eve.	Morn.	Eve.	Morn.	Eve.	Morn.	Eve.	Morn.	Eve.	
Sept. 16.	Frank Flinn.....	34	W	M	S	Memphis, Tenn.....	102 ¹	102 ³	98 ²	97 ²	97 ²	97 ²	104	106	104	74	62	64	62
Sept. 17.	Mrs. G. W. Ernest.....	36	W	F	M	Paris, Tenn.....	102 ²	101 ¹	101 ³	98 ²	99 ¹	101 ³	104	100	104	80	88	106	106
Sept. 17.	Jas. C. Atkinson.....	26	W	M	S	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 18.	Mrs. Annie Tedro.....	26	W	F	W	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 18.	Mrs. E. Shaughnessy.....	30	W	F	M	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 18.	R. W. Lawton.....	30	W	M	M	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 18.	Mrs. M. Wheelock.....	36	W	F	M	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 18.	Henry B. Samuels.....	22	W	M	M	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 18.	R. H. Lawton, M. D.....	68	W	M	M	Memphis, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 19.	Edolph Hellrig.....	27	W	M	M	Memphis, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 20.	S. P. Reau.....	27	W	M	M	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 20.	Man Foley.....	27	W	M	M	Paris, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 20.	Elizabeth Fink.....	28	W	F	M	Covington, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 21.	J. B. W. Connolly.....	29	W	M	M	Covington, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 21.	Michael F. Muloney.....	33	W	M	M	Bowling Gr'n, Ky.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106
Sept. 21.	James Dodd.....	40	W	M	M	Memphis, Tenn.....	102 ²	101 ³	101 ³	98 ²	99 ¹	101 ³	110	114	110	110	106	96	106

AN AUTO-OBITUARY.—Medical Times and Gazette: It is not a usual thing for a man to write a certificate of his own death; but last week a bookbinder was tried at the Central Criminal Court for obtaining money by false pretenses from the Hearts of Oak Benefit Society, by means of forged documents. He first secured various weekly sick payments by means of forged medical certificates, and this succeeded so well that he next forged the medical certificate of the birth of an imaginary child, which entitled him to a payment of thirty shillings. Finally, he tendered to the secretary a forged certificate of his own death, which he attributed to cancer of the tongue while under treatment in Charing-cross Hospital. The jury found the man guilty, and his talent for forging medical certificates was stopped, at least for the present, by a sentence of eighteen months' hard labor.

LATE advices report cholera to be raging in the Bassim district, Berar, ten hundred and eighty-nine cases out of sixteen hundred and sixty-two having terminated fatally. The disease in a less virulent form is prevailing also in Akola and Oomrawuttee.

CONTAGION THROUGH BOOKS.—Medical Times and Gazette: A writer in the Deutsch Illustrated Gewerhez calls attention to the fact that the material of contagion may not only be conveyed by means of water, clothing, the air, dead hair, etc., but also by books. This is the case especially with respect to the books of circulating libraries, and most of all in those of small towns in which books pass for years through the hands of numerous readers, exhibiting plain enough marks of their having been used. Indeed, it is quite remarkable how the most delicate and particular of persons will handle these books without even giving it a thought how often they may have been perused on beds of sickness and bathed in the perspiration of different readers; and yet how possible it is that they may act as the carriers of contagious germs.

SUGGESTION OF A PLAN OF TREATMENT FOR YELLOW FEVER, TO BE USED BY THOSE WHO ARE UNABLE TO PROCURE MEDICAL AID WITHOUT DELAY.—LETTER FROM A PHYSICIAN:

CHARLESTON, September —, 1878.

To Medical Officers of Boards of Health:

We propose to publish a circular for distribution, as you think best, containing some

plan of treating the disease, which is efficient, safe, and unhurtful, to be used by those who can not have quickly the services of a physician. In yellow fever, time is almost every thing, for life is compromised by the fever of the first few hours. With a long and frequent experience of this fever,* we still firmly believe that many would recover—a very large proportion—if they would begin, at the very inception of the attack, with cold sponging (or with towels) of the head, hands, and arms with ice-water, thoroughly applied and repeated frequently as the temperature rises, and for the first one, two, or three days, if necessary. Give at the beginning fifteen, twenty, or twenty-five grains of calomel, with the same of quinine; follow, in three or four hours, with a dose of salts. Then no more medicine, save a little acetate of potash (four or five grains) with one eighth to one twelfth of a grain of morphine, in a little water, used two or three times a day to quiet irritation. Place the feet in hot mustard water, and cover the abdomen with mustard plasters at the beginning, to be repeated. Use care with regard to food. If the fever is thus restrained and kept so by these means, in fair cases subsequent bad symptoms can hardly occur. There will be no black vomit if the fever of the first few hours is kept within bounds, for then all the mischief is done. This is all, and it is enough, not too much nor too little.

N. B.—No time should be lost at the beginning.

The apparent simplicity of these measures does not detract from their value.

Those who are severely prejudiced against the use of quinine may leave it out, as we have no time for proof or argument; but we commend it highly for several reasons.

F. PEYRE PORCHER, M. D.,

Associate Physician City Hospital, Charleston, S. C.

OSTRICH PEPSINE. — Medical Times and Gazette: Mons. Alfred Ebelot, in an article in the *Revue des Deux Mondes* of December, 1877, on the means employed in the Argentine Republic to protect settlers in the Pampas from the Indians, gives the following statement with regard to ostrich pepsine: The soldiers and others employed never could resist an ostrich hunt when they saw a male ostrich, as is the custom of

that bird, taking out its young brood for food and exercise. The parent bird generally escaped, leaving its young in the hands of its enemies. When other food was scarce they ate the young ostriches. Some portions of the flesh of these birds when young and fat are reckoned dainty by the Indians; but it has a smack of rancid oil and a "*fumet sauvage*" which are not without originality, and remind one of the cuisine of a Spanish inn. This matches well the acidity of the red pepper which, made with salt into little tablets, is the favorite condiment of the gourmets of the Pampas. "While eating the ostrich the Indians always carefully put aside the stomach in order to collect the pepsine which it contains. The stomach of the ostrich," says Mons. Ebelot, "is celebrated for its incredible powers of digestion. The abundance of pepsine, to which it owes this faculty, has created among the Indians a curious commercial fraud. They dry it and sell it literally for its weight in gold. It is used for the purpose of restoring worn-out stomachs." We think "ostrich pepsine" such a splendid name for business purposes that we wonder it has never been adopted. The pepsine of the pig would have no chance in competition with that of the ostrich, and no great city dinner or regimental mess would be complete without a supply of this infallible specific "*pour refaire les estomacs délabrés*."

Selections.

Dislocations of Muscles and their Treatment.—British Med. Jour.: Mr. Callender remarks that but little attention has been paid to this class of injury, though they are followed by considerable inconvenience, by pain often of long continuance, and by interference with the very amusement or occupation in the practice of which they have been sustained. Mr. Callender refers to various cases of displaced tendon, as of the biceps, the tendons about the wrist, and the peronei, in all of which, while the reposition of the tendon is not very difficult, the unsatisfactory feature of the treatment is the impossibility of preventing in many instances the recurrence of the displacement. He then proceeds to consider dislocations of the muscles themselves, and the following may be taken as a typical case: A man, aged forty-six, was playing at lawn-tennis, when he felt a sudden movement, with intense pain, in the right fore-arm. He rested the arm, had advice, but the pain persisted. When the accident happened the fore-arm was suddenly thrown into the extreme of pronation while he was making a back-stroke. On examining the arm Mr. Callender found there was tenderness along the course of the pronator radii

*See articles in "Charleston Medical Journal and Review" for January, 1858, March, '59, October, '73, and January, '77, for the proofs we have given of the efficiency of the method advised.

teres, and the pain in the fore-arm was severe when the hand was moved in pronation. The hand was brought into pronation, and with a pad fitted to and applied over the course of the pronator firm pressure was made upon the muscle, while the hand was carried to the extreme of supination. The pressure, the patient said, gave relief, and on removing it the pain had ceased; the fore-arm could now be freely moved. The parts were rested in a sling, and he was told to keep the arm quiet. In two days' time he again tried the muscle at lawn-tennis, and again the pain recurred. The muscle was again returned to its place, and this time the arm was so fixed that the muscle was secured against further dislocation, and as no movements have since been made which would cause its displacement, the patient has remained well. As general rules for reducing dislocation of muscles, Mr. Callender recommends that an accurate diagnosis should first be made of the muscle dislocated; secondly, the muscle should be relaxed as far as possible; thirdly, by firm manipulation, such as the rubbing with the hand or by kneading with the thumb, an endeavor should be made to replace it; and lastly, pressure should be made while the muscle is on the stretch.

Treatment of Chorea.—Professor Germain Sée (Union Med.) has but a very low opinion of the efficacy of drugs in the treatment of chorea. In the slight forms he observes that treatment is well-nigh useless, and we ought to content ourselves with prescribing sulphurous baths. When the disease has lasted a considerable time, and its subjects have become anæmic, the administration of the various tonics, and especially iron, is indicated. Finally, in very bad cases we may have recourse to inhalations of chloroform for the purpose of curbing the movements when these are very violent. Arsenical preparations also possess a certain amount of efficacy; but it is right to say, in a general manner, that chorea cures itself, and that the various modes of treatment which are resorted to exert but little effect upon its duration.—*Med. Times and Gazette.*

Therapeutic Action of Iodoform.—Dr. Moleschott (Wiener Medicin. Wochenschrift) states that he has used iodoform with good result in the treatment of exudation into the pleura, pericardium, and peritoneum, and of the acute hydrocephalus of children. He generally applied it in the form of ointment (one in fifteen of lard) or with elastic collodion (one in fifteen of collodion). Large glandular swellings were caused to disappear under the use of the iodized collodion. It was found useful as a means of assuaging pain in gout, neuralgia, and neuritis. Syphilitic myocarditis was cured by iodoform inunction, combined with the internal use of the drug in doses of from three fourths of a grain to a grain and a half daily. Iodoform appears to act like digitalis upon the heart, increasing the strength and reducing the frequency of its beats, and was hence used successfully in uncompensated valve-disease. Its action depends probably on its ready decomposition, by which the iodine in the nascent state is brought into action upon the tissues.

Ergotin in Diseases of the Bladder.—London Med. Record: Dr. Molfese, in the Cirillo of May 5, 1878, calls attention to the results of the internal use of ergotin in cases of paralysis of the bladder, hemorrhage, etc. He relates three cases. In the first a

priest, aged eighty-six, was suddenly attacked with retention of urine. After this condition had lasted thirty-six hours the urine was drawn off by a catheter. It was turbid, and contained mucus and pus, and, eight days later, blood in large quantity. Injections of alum, nitrate of silver, and sulphate of zinc produced no effect. Dr. Molfese then ordered a spoonful of the following mixture every half hour: Bonjeau's ergotin, one gram; water, one hundred grams; syrup of orange-peel, fifty grams. Injections of a very dilute solution of salicylic acid were also given. In eight days the blood had completely disappeared from the urine. The catheter was used for some days, and after treatment for a month the patient was cured. In the second case a man, aged seventy-two, had retention of urine, which contained mucus, pus, and blood. After the use of ergotin for twenty days the bladder regained its power. The third case was that of a man, aged fifty-one, who had twice suffered from gonorrhea, specific ulcer, and suppurating bubo. For two months he had been unable to retain his urine. After the use of ergotin for ten days the incontinence had nearly disappeared, and at the end of fourteen days the patient was cured.

Wendt on Trichinosis.—Dr. Edmund C. Wendt (American Journal of Med. Science) has contributed a paper to the literature of trichina infection, in which he states that encysted trichinae may for a series of years give rise to severe muscular pain, of pseudo-rheumatismal character, and that the muscles may undergo permanent degeneration.

Gunshot Wounds.—London Medical Record: The affair of Godefroy (1877) led to the repetition of several very conclusive experiments, which prove that in the old conditions, where defective wadding and powder were used, a shot fired with the muzzle of the gun close to an object inevitably caused tattooing of the parts surrounding the wound. It is not so now, for with the predominance of the fulminate of mercury the combustion of the particles of carbon is much more complete. It may therefore be affirmed that the absence of tattooing can be no longer considered as a certain proof that a shot has not been fired close to an object.

Boric Acid in Skin Diseases.—Neumann (Centralblatt für Chir.) has employed boric acid, sometimes alone, sometimes in connection with oil of cloves, in the fluid form, and in ointments. In pityriasis versicolor and tinea tonsurans, alcoholic solutions, ten to three hundred with 2.50 of oil of cloves, and twenty to three hundred with 3.0 of oil of cloves, have been used. In pityriasis rubra and all varieties of eczema the acid has been employed in the form of ointments of ten to fifty. Neumann considers the remedy a valuable one.

Purgative Milk.—Jour. de Méd. et de Chir.: In his book on Milk, Cream, Butter, M. Husson calls attention to Planche's formula for purgative milk, a cathartic which has the advantages of being easy to take and certain in action:

R Resinæ scammoniae..... grs. vi (40 ctgms.);
Sacc. albæ..... ʒ ijs (10 grams);
Trit. et ad. gradatim:
Lactis puri..... ʒ vi (100 grams);
Aq. laurocerasi..... ℥ xlv. ʒ j (¼ gram).

M. A single dose for an adult.